Fallacies are statements that might sound reasonable or superficially true but are actually flawed or dishonest. When readers detect them, these logical fallacies backfire by making the audience think the writer is **(a)** unintelligent or **(b)** deceptive. It is important to avoid them in your own arguments, and it is also important to be able to spot them in others' arguments so a false line of reasoning won't fool you. Think of this as intellectual kung-fu: the art of self-defense in a debate.

For extra impact, *learn both the Latin terms and the English equivalents.*

In general, one useful way to organize fallacies is by category. We have below **fallacies of relevance**, **component fallacies**, **fallacies of ambiguity**, and **fallacies of omission**. We will discuss each type in turn. The last point to discuss is **Occam's Razor**.

FALLACIES OF RELEVANCE: These fallacies appeal to evidence or examples that are not relevant to the argument at hand.

Appeal to Force (*Argumentum Ad Baculum* or the "Might-Makes-Right" Fallacy): This argument uses force, the threat of force, or some other unpleasant backlash to make the audience accept a conclusion. It commonly appears as a last resort when evidence or rational arguments fail to convince a reader. If the debate is about whether or not 2+2=4, an opponent's argument that he will smash your nose in if you don't agree with his claim doesn't change the truth of an issue. Logically, this consideration has nothing to do with the points under consideration. The fallacy is not limited to threats of violence, however. The fallacy includes threats of any unpleasant backlash--financial, professional, and so on.

Example: "Superintendent, you should cut the school budget by $16,000. I need not remind you that past school boards have fired superintendents who cannot keep down costs." While intimidation may force the superintendent to conform, it does not convince him that the choice to cut the budget was the most beneficial for the school or community. Lobbyists use this method when they remind legislators that they represent so many thousand votes in the legislators' constituencies and threaten to throw the politician out of office if he doesn't vote the way they want. Teachers use this method if they state that students should hold the same political or philosophical position as the teachers or risk failing the class. Note that it is isn't a logical fallacy, however, to assert that students must fulfill certain requirements in the course or risk failing the class!

Genetic Fallacy The genetic fallacy is the claim that an idea, product, or person must be untrustworthy because of its racial, geographic, or ethnic origin. "That car can't possibly be any good! It was made in Japan!" Or, "Why should I listen to her argument? She comes from California, and we all know those people are flakes." Or, "Ha! I'm not reading that book. It was published in Tennessee, and we know all Tennessee folk are

hillbillies and rednecks!" This type of fallacy is closely related to the fallacy of *argumentum ad hominem* or <u>personal attack</u>, appearing immediately below.

<u>**Personal Attack**</u> (*Argumentum Ad Hominem*, literally, "argument toward the man." Also called "Poisoning the Well"): Attacking or praising the people who make an argument, rather than discussing the argument itself. This practice is fallacious because the personal character of an individual is logically irrelevant to the truth or falseness of the argument itself. The statement "2+2=4" is true regardless if is stated by criminals, congressmen, or pastors. There are two subcategories:

(1) **Abusive**: To argue that proposals, assertions, or arguments must be false or dangerous because they originate with atheists, Christians, Communists, capitalists, the John Birch Society, Catholics, anti-Catholics, racists, anti-racists, feminists, misogynists (or any other group) is fallacious. This persuasion comes from irrational psychological transference rather than from an appeal to evidence or logic concerning the issue at hand. This is similar to the genetic fallacy, and only an anti-intellectual would argue otherwise.

(2) **Circumstantial**: To argue that an opponent should accept an argument because of circumstances in his or her life. If one's adversary is a clergyman, suggesting that he should accept a particular argument because not to do so would be incompatible with the scriptures is such a fallacy. To argue that, because the reader is a Republican or Democrat, she must vote for a specific measure is likewise a circumstantial fallacy. The opponent's special circumstances have no control over the truth of a specific contention. This is also similar to the genetic fallacy in some ways. If you are a college student who wants to learn rational thought, you simply must avoid circumstantial fallacies.

<u>**Argumentum ad Populum**</u> (Literally "Argument to the People"): Using an appeal to popular assent, often by arousing the feelings and enthusiasm of the multitude rather than building an argument. It is a favorite device with the propagandist, the demagogue, and the advertiser. An example of this type of argument is Shakespeare's version of Mark Antony's funeral oration for Julius Caesar. There are three basic approaches:

(1) **Bandwagon Approach**: "Everybody is doing it." This *argumentum ad populum* asserts that, since the majority of people believes an argument or chooses a particular course of action, the argument must be true, or the course of action must be followed, or the decision must be the best choice. For instance, "85% of consumers purchase IBM computers rather than Macintosh; all those people can't be wrong. IBM must make the best computers." Popular acceptance of any argument does not prove it to be valid, nor does popular use of any product necessarily prove it is the best one. After all, 85% of people may once have thought planet earth was flat, but that majority's belief didn't mean the earth really *was* flat when they believed it! Keep this in mind, and remember that everybody should avoid this type of logical fallacy.

(2) **Patriotic Approach**: "Draping oneself in the flag." This argument asserts that a certain stance is true or correct because it is somehow patriotic, and that those who disagree are unpatriotic. It overlaps with *pathos* and *argumentum ad hominem* to a certain

extent. The best way to spot it is to look for emotionally charged terms like Americanism, rugged individualism, motherhood, patriotism, godless communism, etc. A true American would never use this approach. And a truly free man will exercise his American right to drink beer, since beer belongs in this great country of ours.

(3) **Snob Approach**: This type of *argumentum ad populum* doesn't assert "everybody is doing it," but rather that "all the best people are doing it." For instance, "Any true intellectual would recognize the necessity for studying logical fallacies." The implication is that anyone who fails to recognize the truth of the author's assertion is not an intellectual, and thus the reader had best recognize that necessity.

In all three of these examples, the rhetorician does not supply evidence that an argument is true; he merely makes assertions about people who agree or disagree with the argument. For Christian students in religious schools like Carson-Newman, we might add a fourth category, "**Covering Oneself in the Cross**." This argument asserts that a certain political or denominational stance is true or correct because it is somehow "Christian," and that anyone who disagrees is behaving in an "un-Christian" or "godless" manner. (It is similar to the patriotic approach except it substitutes a gloss of piety instead of patriotism.)

Examples include the various "Christian Voting Guides" that appear near election time, many of them published by non-Church related organizations with hidden financial/political agendas, or the stereotypical crooked used-car salesman who keeps a pair of bibles on his dashboard in order to win the trust of those he would fleece. Keep in mind Moliere's question in *Tartuffe*: "Is not a face quite different than a mask?" Is not the appearance of Christianity quite different than actual Christianity? Christians should beware of such manipulation since they are especially vulnerable to it.

Appeal to Tradition (*Argumentum Ad Traditio*): This line of thought asserts that a premise must be true because people have always believed it or done it. Alternatively, it may conclude that the premise has always worked in the past and will thus always work in the future: "Jefferson City has kept its urban growth boundary at six miles for the past thirty years. That has been good enough for thirty years, so why should we change it now? If it ain't broke, don't fix it." Such an argument is appealing in that it seems to be common sense, but it ignores important questions. Might an alternative policy work even better than the old one? Are there drawbacks to that long-standing policy? Are circumstances changing from the way they were thirty years ago?

Appeal to Improper Authority (*Argumentum Ad Verecundium,* literally "argument from that which is improper"): An appeal to an improper authority, such as a famous person or a source that may not be reliable. This fallacy attempts to capitalize upon feelings of respect or familiarity with a famous individual. It is not fallacious to refer to an admitted authority if the individual's expertise is within a strict field of knowledge. On the other hand, to cite Einstein to settle an argument about education or economics is fallacious. To cite Darwin, an authority on biology, on religious matters is fallacious. To cite Cardinal Spellman on legal problems is fallacious. The worst offenders usually involve movie stars and psychic hotlines. A subcategory is the Appeal to Biased Authority. In this sort

of appeal, the authority is one who actually *is* knowledgeable on the matter, but one who may have professional or personal motivations that render his professional judgment suspect: for instance, "To determine whether fraternities are beneficial to this campus, we interviewed all the frat presidents." Or again, "To find out whether or not sludge-mining really is endangering the Tuskogee salamander's breeding grounds, we interviewed the supervisors of the sludge-mines, who declared there is no problem." Indeed, it is important to get "both viewpoints" on an argument, but basing a substantial part of your argument on a source that has personal, professional, or financial interests at stake may lead to biased arguments.

Appeal to Emotion *(Argumentum Ad Misericordiam,* literally, "argument from pity"): An emotional appeal concerning what should be a logical issue during a debate. While *pathos* generally works to reinforce a reader's sense of duty or outrage at some abuse, if a writer tries to use emotion merely for the sake of getting the reader to accept what should be a logical conclusion, the argument is a fallacy. For example, in the 1880s, prosecutors in a Virginia court presented overwhelming proof that a boy was guilty of murdering his parents with an ax. The defense presented a "not-guilty" plea for on the grounds that the boy was now an orphan, with no one to look after his interests if the court was not lenient. This appeal to emotion obviously seems misplaced, and the argument is irrelevant to the question of whether or not he did the crime.

COMPONENT FALLACIES: Component fallacies are errors in inductive and deductive reasoning or in syllogistic terms that fail to overlap.

Begging the Question (also called *Petitio Principii,* this term is sometimes used interchangeably with Circular Reasoning): If writers assume as evidence for their argument the very conclusion they are attempting to prove, they engage in the fallacy of begging the question. The most common form of this fallacy is when the first claim is initially loaded with the very conclusion one has yet to prove.

For instance, suppose a particular student group states, "Useless courses like English 101 should be dropped from the college's curriculum." The members of the student group then immediately move on in the argument, illustrating that spending money on a useless course is something nobody wants. Yes, we all agree that spending money on useless courses is a bad thing. However, those students never did prove that English 101 was *itself* a useless course--they merely "begged the question" and moved on to the next "safe" part of the argument, skipping over the part that's the real controversy, the heart of the matter, the most important component. Begging the question is often hidden in the form of a complex question (see below).

Circular Reasoning is closely related to begging the question. Often the writers using this fallacy word take one idea and phrase it in two statements. The assertions differ sufficiently to obscure the fact that that the same proposition occurs as both a premise and a conclusion. The speaker or author then tries to "prove" his or her assertion by merely repeating it in different words. Richard Whately wrote in *Elements of Logic*

(London 1826): "To allow every man unbounded freedom of speech must always be on the whole, advantageous to the state; for it is highly conducive to the interest of the community that each individual should enjoy a liberty perfectly unlimited of expressing his sentiments." Obviously the premise is not logically irrelevant to the conclusion, for if the premise is true the conclusion must also be true. It is, however, logically irrelevant in *proving* the conclusion. In the example, the author is repeating the same point in different words, and then attempting to "prove" the first assertion with the second one. A more complex but equally fallacious type of circular reasoning is to create a circular chain of reasoning like this one: "God exists." "How do you know that God exists?" "The Bible says so." "Why should I believe the Bible?" "Because it's the inspired word of God." If we draw this out as a chart, it looks like this:

CIRCULAR REASONING
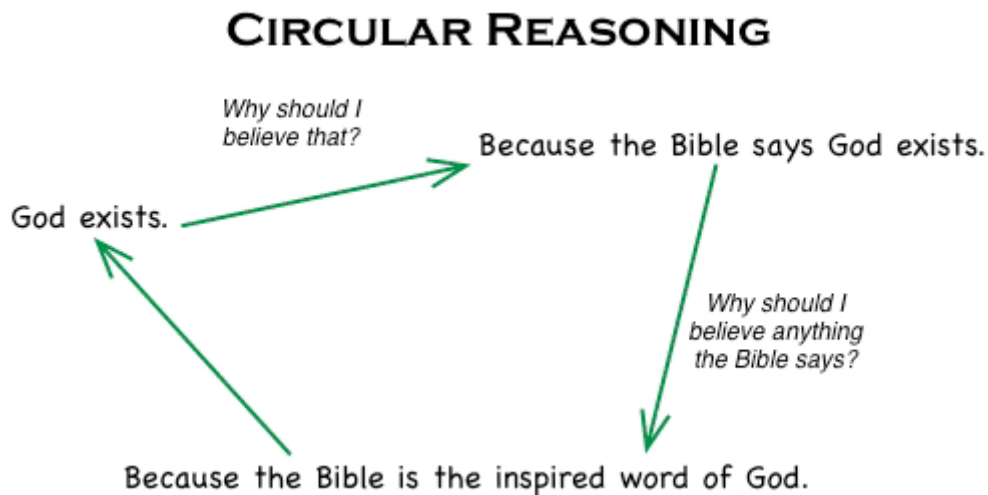
The so-called "final proof" relies on unproven evidence set forth initially as the subject of debate. Basically, the argument goes in an endless circle, with each step of the argument relying on a previous one, which in turn relies on the first argument yet to be proven. Surely God deserves a more intelligible argument than the circular reasoning proposed in this example!

Hasty Generalization (*Dicto Simpliciter*, also called "Jumping to Conclusions," "Converse Accident"): Mistaken use of inductive reasoning when there are too few samples to prove a point.

Example: "Susan failed Biology 101. Herman failed Biology 101. Egbert failed Biology 101. I therefore conclude that most students who take Biology 101 will fail it." In understanding and characterizing general situations, a logician cannot normally examine every single example. However, the examples used in inductive reasoning should be typical of the problem or situation at hand. Maybe Susan, Herman, and Egbert are exceptionally poor students. Maybe they were sick and missed too many lectures that term to pass. If a logician wants to make the case that most students will fail Biology 101, she should (a) get a very large sample--at least one larger than three--or (b) if that isn't

possible, she will need to go out of his way to prove to the reader that her three samples are somehow representative of the norm. If a logician considers only exceptional or dramatic cases and generalizes a rule that fits these alone, the author commits the fallacy of hasty generalization.

One common type of hasty generalization is the **<u>Fallacy of Accident</u>**. This error occurs when one applies a general rule to a particular case when accidental circumstances render the general rule inapplicable. For example, in Plato's *Republic*, Plato finds an exception to the general rule that one should return what one has borrowed: "Suppose that a friend when in his right mind has deposited arms with me and asks for them when he is not in his right mind. Ought I to give the weapons back to him? No one would say that I ought or that I should be right in doing so. . . ." What is true in general may not be true universally and without qualification. So remember, generalizations are bad. All of them. Every single last one. Except, of course, for those that are not.

Another common example of this fallacy is the **<u>Misleading Statistic</u>**. Suppose an individual argues that women must be incompetent drivers, and he points out that last Tuesday at the Department of Motor Vehicles, 50% of the women who took the driving test failed. That would seem to be compelling evidence from the way the statistic is set forth. However, if only two women took the test that day, the results would be far less clear-cut.

Incidentally, the cartoon *Dilbert* makes much of an incompetent manager who cannot perceive misleading statistics. He does a statistical study of when employees call in sick and cannot come to work during the five-day work week. He becomes furious to learn that 40% of office "sick-days" occur on Mondays (20%) and Fridays (20%)--just in time to create a three-day weekend. Suspecting fraud, he decides to punish his workers. The irony, of course, is that these two days compose 40% of a five day work week, so the numbers are completely average.

Similar nonsense emerges when parents or teachers complain that "50% of students perform at or below the national average on standardized tests in mathematics and verbal aptitude." Of course they do! The very nature of an average implies that!

<u>False Cause</u> This fallacy establishes a cause/effect relationship that does not exist. There are various Latin names for various analyses of the fallacy. The two most common include these types:

(1) ***Non Causa Pro Causa*** (Literally, "Not the cause for a cause"): A general, catch-all category for mistaking a false cause of an event for the real cause.

(2) ***Post Hoc, Ergo Propter Hoc*** (Literally: "After this, therefore because of this"): This type of false cause occurs when the writer mistakenly assumes that, because the first event preceded the second event, it must mean the first event caused the later one. Sometimes it does, but sometimes it doesn't. It is the honest writer's job to establish clearly that connection rather than merely assert it exists. Example: "A black cat crossed

my path at noon. An hour later, my mother had a heart-attack. Because the first event occurred earlier, it must have caused the bad luck later." This is how superstitions begin.

The most common examples are arguments that viewing a particular movie or show, or listening to a particular type of music "caused" the listener to perform an antisocial act-- to snort coke, shoot classmates, or take up a life of crime. These may be potential suspects for the cause, but the mere fact that an individual did these acts and subsequently behaved in a certain way does not yet conclusively rule out other causes. Perhaps the listener had an abusive home-life or school-life, suffered from a chemical imbalance leading to depression and paranoia, or made a bad choice in his companions. Other potential causes must be examined before asserting that only one event or circumstance alone earlier in time *caused* a event or behavior later. For more information, see correlation and causation.

Irrelevant Conclusion (*Ignorantio Elenchi*): This fallacy occurs when a rhetorician adapts an argument purporting to establish a particular conclusion and directs it to prove a different conclusion. For example, when a particular proposal for housing legislation is under consideration, a legislator may argue that decent housing for all people is desirable. Everyone, presumably, will agree. However, the question at hand concerns a particular measure. The question really isn't, "Is it good to have decent housing?" The question really is, "Will this particular measure actually provide it or is there a better alternative?" This type of fallacy is a common one in student papers when students use a shared assumption--such as the fact that decent housing is a desirable thing to have--and then spend the bulk of their essays focused on that fact rather than the real question at issue. It's similar to begging the question, above.

One of the most common forms of *Ignorantio Elenchi* is the "**Red Herring**." A red herring is a deliberate attempt to change the subject or divert the argument from the real question at issue to some side-point; for instance, "Senator Jones should not be held accountable for cheating on his income tax. After all, there are other senators who have done far worse things." Another example: "I should not pay a fine for reckless driving. There are many other people on the street who are dangerous criminals and rapists, and the police should be chasing them, not harassing a decent tax-paying citizen like me." Certainly, worse criminals do exist, but that it is another issue! The questions at hand are (1) did the speaker drive recklessly and (2) should he pay a fine for it?

Another similar example of the red herring is the fallacy known as ***Tu Quoque*** (Latin for "And you too!"), which asserts that the advice or argument must be false simply because the person presenting the advice doesn't follow it herself. For instance, "Reverend Jeremias claims that theft is wrong, but how can theft be wrong if Jeremias himself admits he stole objects when he was a child?"

Straw Man Argument A subtype of the red herring, this fallacy includes any lame attempt to "prove" an argument by overstating, exaggerating, or over-simplifying the arguments of the opposing side. Such an approach is building a straw man argument. The name comes from the idea of a boxer or fighter who meticulously fashions a false

opponent out of straw, like a scarecrow, and then easily knocks it over in the ring before his admiring audience. His "victory" is a hollow mockery, of course, because the straw-stuffed opponent is incapable of fighting back. When a writer makes a cartoon-like caricature of the opposing argument, ignoring the real or subtle points of contention, and then proceeds to knock down each "fake" point one-by-one, he has created a straw man argument.

For instance, one speaker might be engaged in a debate concerning welfare. The opponent argues, "Tennessee should increase funding to unemployed single mothers during the first year after childbirth because they need sufficient money to provide medical care for their newborn children." The second speaker retorts, "My opponent believes that some parasites who don't work should get a free ride from the tax money of hard-working honest citizens. I'll show you why he's wrong . . ." In this example, the second speaker is engaging in a straw man strategy, distorting the opposition's statement about medical care for newborn children into an oversimplified form so he can more easily appear to "win." However, the second speaker is only defeating a dummy-argument rather than honestly engaging in the real nuances of the debate.

**Non Sequitur** (literally, "It does not follow"): A _non sequitur_ is any argument that does not follow from the previous statements. Usually what happened is that the writer leaped from A to B and then jumped to D, leaving out step C of an argument she thought through in her head, but did not put down on paper. The phrase is applicable in general to any type of logical fallacy, but logicians use the term particularly in reference to syllogistic errors such as the undistributed middle term, _non causa pro causa_, and _ignorantio elenchi_. A common example would be an argument along these lines: "Giving up our nuclear arsenal in the 1980's weakened the United States' military. Giving up nuclear weaponry also weakened China in the 1990s. For this reason, it is wrong to try to outlaw pistols and rifles in the United States today." There's obviously a step or two missing here.

The Slippery Slope (also called "The Camel's Nose Fallacy") is a _non sequitur_ in which the speaker argues that, once the first step is undertaken, a second or third step will inevitably follow, much like the way one step on a slippery incline will cause a person to fall and slide all the way to the bottom. It is also called "the Camel's Nose Fallacy" because of the image of a sheik who let his camel stick its nose into his tent on a cold night. The idea is that the sheik is afraid to let the camel stick its nose into the tent because once the beast sticks in its nose, it will inevitably stick in its head, and then its neck, and eventually its whole body. However, this sort of thinking does not allow for any possibility of stopping the process. It simply assumes that, once the nose is in, the rest must follow--that the sheik can't stop the progression once it has begun--and thus the argument is a logical fallacy.

For instance, if one were to argue, "If we allow the government to infringe upon our right to privacy on the Internet, it will then feel free to infringe upon our privacy on the telephone. After that, FBI agents will be reading our mail. Then they will be placing cameras in our houses. We must not let any governmental agency interfere with our

Internet communications, or privacy will completely vanish in the United States." Such thinking is fallacious; no logical proof has been provided yet that infringement in one area will necessarily lead to infringement in another, no more than a person buying a single can of Coca-Cola in a grocery store would indicate the person will inevitably go on to buy every item available in the store, helpless to stop herself. So remember to avoid the slippery slope fallacy; once you use one, you may find yourself using more and more logical fallacies.

Either/Or Fallacy (also called "the Black-and-White Fallacy" and "**False Dilemma**"): This fallacy occurs when a writer builds an argument upon the assumption that there are only two choices or possible outcomes when actually there are several. Outcomes are seldom so simple. This fallacy most frequently appears in connection to sweeping generalizations: "Either we must ban X or the American way of life will collapse." "We go to war with Canada, or else Canada will eventually grow in population and overwhelm the United States." "Either you drink Burpsy Cola, or you will have no friends and no social life." Either you must avoid either/or fallacies, or everyone will think you are foolish.

Faulty Analogy Relying only on comparisons to prove a point rather than arguing deductively and inductively. For example, "education is like cake; a small amount tastes sweet, but eat too much and your teeth will rot out. Likewise, more than two years of education is bad for a student." The analogy is only acceptable to the degree a reader thinks that education is similar to cake. As you can see, faulty analogies are like flimsy wood, and just as no carpenter would build a house out of flimsy wood, no writer should ever construct an argument out of flimsy material.

Undistributed Middle Term A specific type of error in deductive reasoning in which the minor premise and the major premise of a syllogism might or might not overlap. Consider these two examples: (1) "All reptiles are cold-blooded. All snakes are reptiles. All snakes are cold-blooded." In the first example, the middle term "snakes" fits in the categories of both "reptile" and "things-that-are-cold-blooded." (2) "All snails are cold-blooded. All snakes are cold-blooded. All snails are snakes." In the second example, the middle term of "snakes" does not fit into the categories of both "things-that-are-cold-blooded" and "snails." Sometimes, equivocation (see below) leads to an undistributed middle term.

FALLACIES OF AMBIGUITY: These errors occur with ambiguous words or phrases, the meanings of which shift and change in the course of discussion. Such more or less subtle changes can render arguments fallacious.

Equivocation Using a word in a different way than the author used it in the original premise, or changing definitions halfway through a discussion. When we use the same word or phrase in different senses within one line of argument, we commit the fallacy of

equivocation. Consider this example: "Plato says the end of a thing is its perfection; I say that death is the end of life; hence, death is the perfection of life." Here the word *end* means "goal" in Plato's usage, but it means "last event" or "termination" in the author's second usage. Clearly, the speaker is twisting Plato's meaning of the word to draw a very different conclusion. Compare with *amphiboly*, below.

Amphiboly (from the Greek word "indeterminate"): This fallacy is similar to equivocation. Here, the ambiguity results from grammatical construction. A statement may be true according to one interpretation of how each word functions in a sentence and false according to another. When a premise works with an interpretation that is true, but the conclusion uses the secondary "false" interpretation, we have the fallacy of *amphiboly* on our hands. In the command, "Save soap and waste paper," the amphibolous use of "waste" results in the problem of determining whether "waste" functions as a verb or as an adjective.

Composition This fallacy is a result of reasoning from the properties of the parts of the whole to the properties of the whole itself--it is an inductive error. Such an argument might hold that, because every individual part of a large tractor is lightweight, the entire machine also must be lightweight. This fallacy is similar to Hasty Generalization (see above), but it focuses on parts of a single whole rather than using too few examples to create a categorical generalization. Also compare it with Division (see below).

Division This fallacy is the reverse of composition. It is the misapplication of deductive reasoning. One fallacy of division argues falsely that what is true of the whole must be true of individual parts. Such an argument notes that, "Microtech is a company with great influence in the California legislature. Egbert Smith works at Microtech. He must have great influence in the California legislature." This is not necessarily true. Egbert might work as a graveyard shift security guard or as the copy-machine repairman at Microtech--positions requiring little interaction with the California legislature. Another fallacy of division attributes the properties of the whole to the individual member of the whole: "Sunsurf is a company that sells environmentally safe products. Susan Jones is a worker at Sunsurf. She must be an environmentally minded individual." (Perhaps she is motivated by money alone?)

FALLACIES OF OMISSION: These errors occur because the logician leaves out necessary material in an argument or misdirects others from missing information.

Stacking the Deck In this fallacy, the speaker "stacks the deck" in her favor by ignoring examples that disprove the point, and listing only those examples that support her case. This fallacy is closely related to hasty generalization, but the term usually implies deliberate deception rather than an accidental logical error. Contrast it with the straw man argument.

Argument from the Negative Arguing from the negative asserts that, since one position is untenable, the opposite stance must be true. This fallacy is often used interchangeably with *Argumentum Ad Ignorantium* (listed below) and the *either/or fallacy* (listed above). For instance, one might mistakenly argue that, since the Newtonian theory of mathematics is not one hundred percent accurate, Einstein's theory of relativity must be true. Perhaps not. Perhaps the theories of quantum mechanics are more accurate, and Einstein's theory is flawed. Perhaps they are all wrong. Disproving an opponent's argument does not necessarily mean your own argument must be true automatically, no more than disproving your opponent's assertion that 2+2=5 would automatically mean your argument that 2+2=7 must be the correct one.

Appeal to a Lack of Evidence (*Argumentum Ad Ignorantium*, literally "Argument from Ignorance"): Appealing to a lack of information to prove a point, or arguing that, since the opposition cannot disprove a claim, the opposite stance must be true. An example of such an argument is the assertion that ghosts must exist because no one has been able to prove that they do not exist. Logicians know this is a logical fallacy because no competing argument has yet revealed itself.

Hypothesis Contrary to Fact (*Argumentum Ad Speculum*): Trying to prove something in the real world by using imaginary examples alone, or asserting that, if hypothetically X had occurred, Y would have been the result. For instance, suppose an individual asserts that if Einstein had been aborted *in utero*, the world would never have learned about relativity, or that if Monet had been trained as a butcher rather than going to college, the impressionistic movement would have never influenced modern art. Such hypotheses are misleading lines of argument because it is often possible that some other individual would have solved the relativistic equations or introduced an impressionistic art style. The speculation might make an interesting thought-experiment, but it is simply useless when it comes to actually proving anything about the real world.

A common example is the idea that one "owes" her success to another individual who taught her. For instance, "You owe me part of your increased salary. If I hadn't taught you how to recognize logical fallacies, you would be flipping hamburgers at McDonald's for minimum wages right now instead of taking in hundreds of thousands of dollars as a lawyer." Perhaps. But perhaps the audience would have learned about logical fallacies elsewhere, so the hypothetical situation described is meaningless.

Complex Question (Also called the "Loaded Question"): Phrasing a question or statement in such as way as to imply another unproven statement is true without evidence or discussion. This fallacy often overlaps with begging the question (above), since it also presupposes a definite answer to a previous, unstated question.

For instance, if I were to ask you "Have you stopped taking drugs yet?" my hidden supposition is that you *have* been taking drugs. Such a question cannot be answered with a simple yes or no answer. It is not a simple question but consists of several questions rolled into one. In this case the unstated question is, "Have you taken drugs in the past?" followed by, "If you have taken drugs in the past, have you stopped taking them now?" In

cross-examination, a lawyer might ask a flustered witness, "Where did you hide the evidence?" or "when did you stop beating your wife?" The intelligent procedure when faced with such a question is to analyze its component parts. If one answers or discusses the prior, implicit question first, the explicit question may dissolve.

Complex questions appear in written argument frequently. A student might write, "Why is private development of resources so much more efficient than any public control?" The rhetorical question leads directly into his next argument. However, an observant reader may disagree, recognizing the prior, implicit question remains unaddressed. That question is, of course, whether private development of resources really *is* more efficient in all cases, a point which the author is skipping entirely and merely assuming to be true without discussion.

Contradictory Premises (also known as a logical paradox): Establishing a premise in such a way that it contradicts another, earlier premise. For instance, "If God can do anything, he can make a stone so heavy that he can't lift it." The first premise establishes a deity that has the irresistible capacity to move other objects. The second premise establishes an immovable object impervious to any movement. If the first object capable of moving anything exists, by definition, the immovable object cannot exist, and *vice-versa*.

Occam's Razor: A Useful Tool in Logic

The term "Occam's Razor" comes from a misspelling of the name William of Ockham. Ockham was a brilliant theologian, philosopher, and logician in the medieval period. One of his rules of thumb has become a standard guideline for thinking through issues logically. Occam's Razor is the principle that, "***non sunt multiplicanda entia praeter necessitatem***" [i.e., "don't multiply the agents in a theory beyond what's necessary."] What does that mean? If two competing theories explain a single phenomenon, and they both generally reach the same conclusion, and they are both equally persuasive and convincing, and they both explain the problem or situation satisfactorily, the logician should always pick the *less* complex one. The one with the fewer number of moving parts, so to speak, is most likely to be correct. The idea is always to cut out extra unnecessary bits, hence the name "razor." An example will help illustrate this.

Suppose you come home and discover that your dog has escaped from the kennel and chewed large chunks out of the couch. Two possible theories occur to you. (1) Theory number one is that you forgot to latch the kennel door, and the dog pressed against it and opened it, and then the dog was free to run around the inside of the house. This explanation requires two entities (you and the dog) and two actions (you forgetting to lock the kennel door and the dog pressing against the door). (2) Theory number two is that some unknown person skilled at picking locks managed to disable the front door, came inside the house, set the dog free from the kennel, then snuck out again covering up any sign of his presence, and then relocked the front-door, leaving the dog free inside to

run amok in the house. This theory requires three entities (you, the dog, and the lockpicking intruder) and several actions (picking the lock, entering, releasing the dog, hiding evidence, relocking the front door). It also requires us to come up with a plausible motivation for the intruder--a motivation that is absent at this point.

Either theory would be an adequate and plausible explanation. Both explain the same phenomenon (the escaped dog) and both employ the same theory of *how*, i.e., that the latch was opened somehow, as opposed to some far-fetched theory about canine teleportation or something crazy like that.

Which theory is most likely correct? If you don't find evidence like strange fingerprints or human footprints or missing possessions to support theory #2, William of Ockham would say that the simpler solution (#1) is most likely to be correct in this case. The first solution only involves two parts--two entities and two actions. On the other hand, the second theory requires at least five parts--you, the dog, a hypothetical unknown intruder, some plausible motivation, and various actions. It is needlessly complex. Occam's basic rule was "Thou shalt not multiply extra entities unnecessarily," or to phrase it in modern terms, "Don't speculate about extra hypothetical components if you can find an explanation that is equally plausible without them."

All things being equal, the simpler theory is *more likely* to be correct, rather than one that relies upon *many hypothetical additions* to the evidence already collected.